

Broad-Band EUV Multilayer Coatings for Solar Physics, Phase I

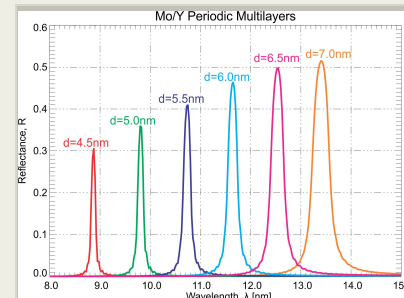
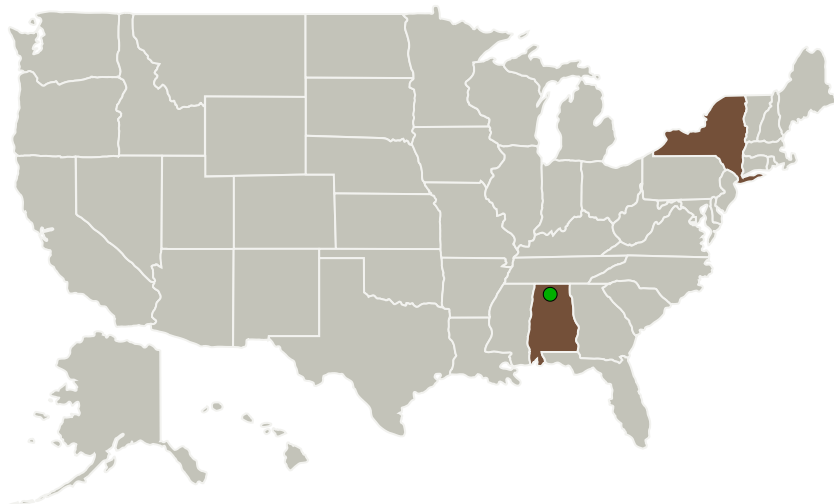
Completed Technology Project (2013 - 2013)



Project Introduction

We propose to develop and commercialize a new class of aperiodic multilayer coating that is designed to provide high normal-incidence reflectance over a wide spectral band-pass in the extreme ultraviolet (EUV) region, specifically from 9 to 14 nm. A broad-band reflective coating working at these wavelengths will enable, for the first time, the construction of high-resolution imaging spectrometers for solar physics utilizing diffraction gratings operating near normal incidence in this range, akin to previous instruments utilizing normal-incidence optics working at longer EUV wavelengths (i.e., $\lambda > 17$ nm) such as the Hinode/EIS satellite instrument and the EUNIS sounding rocket instrument. The development of high-resolution, normal-incidence grating spectrometers operating in the 9–14 nm range will in turn allow for detailed investigations of important solar emission lines, such as those from Fe XVIII – XXIII, that can provide unique diagnostics of high temperature plasma associated with solar flares and active regions. The successful development of efficient, broad-band EUV multilayers for the 9–14 nm region as we propose will thus enable future flights of the EUNIS rocket to target this band, and will also enable the development of high resolution spectrometers that can meet the science requirements of future NASA satellite missions, such as RAM, Solar-C and others that are currently being contemplated.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Reflective X-Ray Optics LLC	Lead Organization	Industry	New York, New York
● Marshall Space Flight Center (MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations

Alabama	New York
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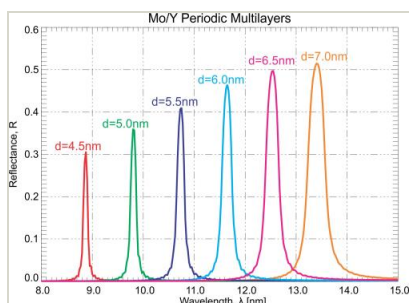
Project Transitions

**May 2013:** Project Start**November 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138023>)

Images



Project Image

Broad-Band EUV Multilayer Coatings For Solar Physics
(<https://techport.nasa.gov/image/135970>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Reflective X-Ray Optics LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

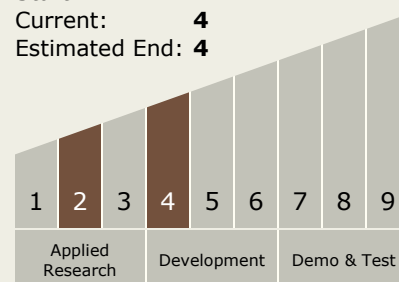
David L Windt

Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.3 Optical Components

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System